NILES®

INSTALLATION GUIDE

FOR USE IN MULTI-CHANNEL MUSIC OR HOME THEATER SYSTEMS

HIGH DEFINITION, SIDE/REAR CHANNEL EFFECTS, CEILING MOUNTED LOUDSPEAKER

CM6HDFX

CONGRATULATIONS!

Thank you for choosing **CM6HDfx High-Definition, Side/Rear Channel Effects, Ceiling Mounted Loudspeaker** from Niles. With proper installation and operation, you should enjoy years of trouble-free use.

Niles manufactures the industry's most complete line of custom installation components and accessories for audio/video systems. To see the complete Niles product assortment, visit us on the Internet at: **www.nilesaudio.com**

TABLE OF CONTENTS

INTRODUCTION

Niles CM6HDfx High-Definition, Side/Rear Channel Effects, Ceiling Mounted Loudspeakers are expressly designed for superior sonic quality. They employ advanced technology components that extract the subtle nuances in recorded music or the thunderous action sound in a movie. They are perfect for applications where in-wall or on-wall surround speakers are not practical. Moreover, these ceiling mount surround speakers are designed for applications where quality of sound is the most important consideration.

FEATURES AND BENEFITS

INJECTION-MOLDED TCC WOOFER WITH BUTYL-RUBBER SURROUND

The CM6HDfx features a newly-developed cone material that combines injection-molded polypropylene with talc, carbon, and ceramic (TCC) stiffening agents. As a result, the cone offers extreme stiffness and light weight for accurate, dynamic response. Additionally, the woofer employs a vented pole-piece for increased bass linearity and a butyl-rubber surround for improved midrange damping and clarity, as well as moisture resistance.

DUAL 3/4" TRI-LAMINATE TETERON TWEETER DOMES WITH FLUID-COOLING AND ULTRA-WIDE DISPERSION FOR CLEAR AND DETAILED HIGH FREQUENCIES

Each tweeter's tri-laminate design consists of an inner textile layer which forms the dome, a high damping layer to kill unwanted resonances, and an outside layer of urethane to add stiffness and prevent breakup modes. The result is a transparently clear, sweet, natural-sounding tweeter, which still maintains extended frequency response. The 20°-pivot angle also ensures optimum, detailed high-frequency coverage.

DIRECT/DIFFUSE SETTING

The DIRECT/DIFFUSE switch allows the installer to select different sound-field patterns for different applications. In the DIFFUSE mode, the tweeters are "out of phase," producing a very natural-sounding diffuse surround effect. In the DIRECT mode, the tweeters are "in phase," producing a more present ("in-your-face") surround effect.

NOTE: BOTH LEFT AND RIGHT SPEAKERS MUST BE ORIENTED WITH THE "OUT-OF-PHASE" TWEETER (IDENTIFIED BY A GRAY DOT) SO THEY POINT IN THE SAME DIRECTION, RELATIVE TO THE LISTENER. SEE PLACEMENT DIAGRAMS STARTING ON PAGE 6 FOR RECOMMENDED PLACEMENTS AND SETTINGS.

INSTALLER-SELECTABLE ACOUSTIC FINE TUNING

Using the baffle-mounted TWEETER LEVEL control, the installer can de-emphasize the treble response by 3 dB after speaker installation to accommodate reflective surfaces and corner loading.

MICROPERF™ ALUMINUM GRILLES

Niles' exclusive MicroPerf™ grille construction provides an exceptionally tight hole pattern for acoustic transparency at all audio frequencies and enables the speaker elements to remain invisible. MicroPerf grilles can also be painted to blend seamlessly with the surrounding decor. Additionally, the aluminum grille material will never rust or discolor over time.

EASY INSTALLATION

Each CM6HDfx speaker employs a bracketless mounting system for easy installation in an existing ceiling. The installer simply cuts a hole in the mounting surface, removes the speaker grille, connects the wires, and places the unit in the opening. The installation is completed by tightening four mounting "dogs" (via front panel screws) to clamp the speaker frame to the drywall.

HOLE-SAVING BRACKET

Available as an optional accessory, a CM6 Series New-Construction Bracket can be installed as a "hole-saver" for each speaker before the drywall goes up. Later, the drywall contractor cuts speaker holes after drywall installation, thereby reducing installation time and minimizing the chance for lost wires.

OPTIONAL FIRE-RATED METAL ENCLOSURE

Optimizes performance and ensures code compliance.

NILES' HD HIGH-DEFINITION VOICE MATCHING

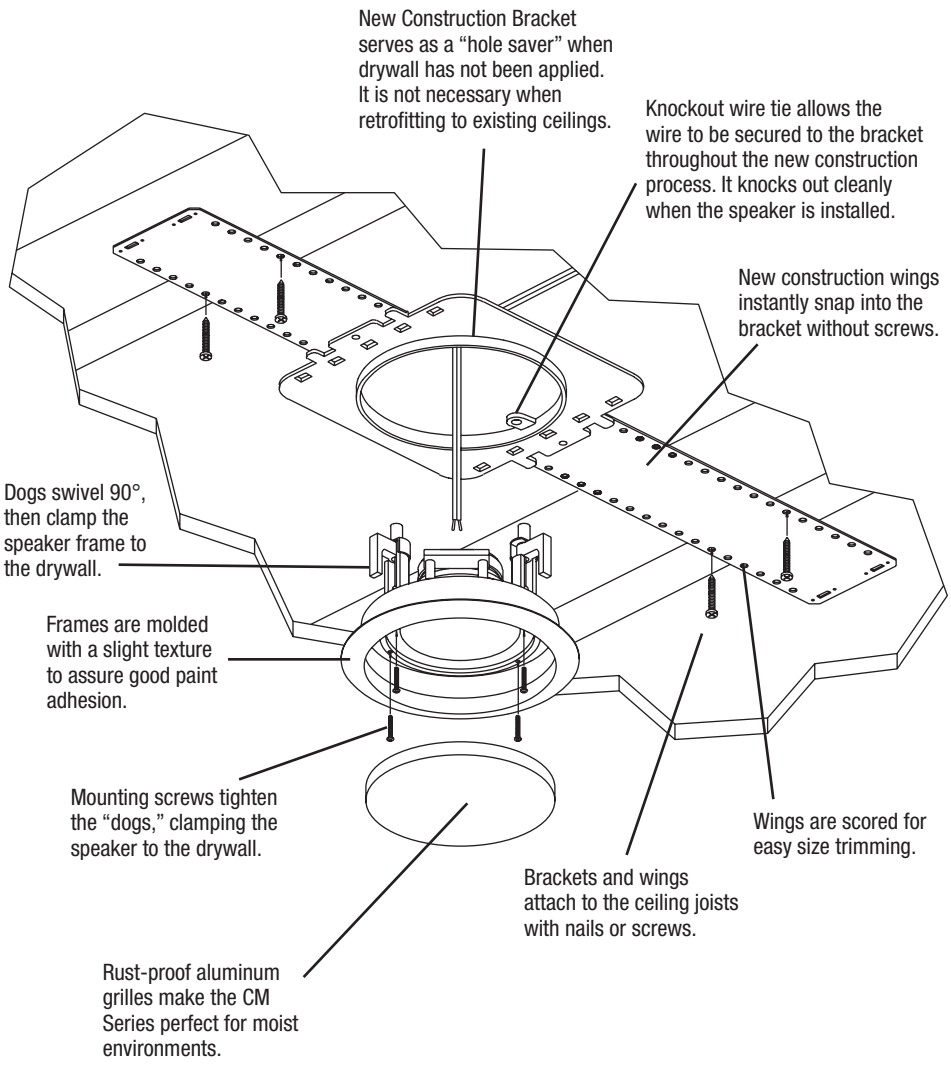
Ensures compatibility with other Niles HD High-Definition in-wall, on-wall, and ceiling mount models to accommodate a wide range of system designs.

DOLBY® DIGITAL READY

The CM6HDfx is specifically designed for Home Theater Sound. This model exceeds the specifications set forth by Dolby Laboratories for the accurate reproduction of Dolby Digital-Encoded Sources.

INSTALLATION CONSIDERATIONS

Figure 1. Mounting a CM6HDfx loudspeaker into a ceiling.



TOOLS AND PRECAUTIONS

We recommend using the following tools to install a CM6HDfx loudspeaker:

- *Electric drill with 1/4- and 1/2-inch drill bits, and a 1-inch flat drill bit (for drilling through studs)*
- *Keyhole or drywall saw*
- *Stiff wire, fish tape, or glow rods (for routing cables)*
- *Phillips screwdriver set*
- *Cable ties*
- *Pencil*
- *Level*
- *Rubber gloves and protective eyewear*

Before starting the installation, please observe the following precautions:

- *Turn off all system power before making any connections.*
- *Always wear protective eyewear when using tools.*
- *Make sure hands are clean before installation.*
- *Wear gloves when working with fiberglass insulation.*

RECOMMENDED AMPLIFIER POWER

For satisfactory performance, we recommend using a surround amplifier with a power rating of 10 to 125 watts. Curiously, most loudspeakers are not damaged by large amplifiers, but rather by small amplifiers. If your system is playing loud music, a small amplifier will run out of power very quickly and can create damaging “clipping” distortions. A more powerful amplifier will play at the same volume without distorting. See **OPERATION** on page 19 for more information about amplifier clipping distortion.

LOUDSPEAKER WIRE

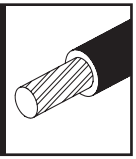
Use 2-conductor loudspeaker wire when connecting loudspeakers to your receiver or amplifier. For most applications, we recommend using 16- or 18-gauge wire. For wiring runs longer than 80 feet, we recommend 14-gauge wire. The spring-loaded terminals of the CM6HDfx will accommodate up to 12-gauge wire directly. Larger sizes can be accommodated via pin connectors.

When running wire inside walls or ceilings, use special jacketed cable (CL-2 or CL-3) to protect the wire and for fire prevention. In some areas, conduit is also required. For a trouble-free installation, low-voltage wire such as speaker wire must be run in accordance with the National Electrical Code and any applicable provisions of the local building code. If you are unsure of the correct installation techniques, wire jacket, or type of conduit to use, consult a professional audio/video installer, building contractor, or the local building and inspection department.

INSULATION BEHIND THE SPEAKER

For best performance from your speakers, lay a batten of fiberglass insulation (e.g., R-19 unfaced insulation) on top of the speaker. Try to keep the same amount of insulation for each speaker, particularly in the same room, for consistent bass response.

TECH TIP
Wire size is expressed by its AWG (American Wire Gauge) number – the lower the number, the larger the wire. For example, 12 AWG is physically larger than 14 AWG.



SPEAKER PLACEMENT

NOTE: THE NILES CM6HDFX LOUDSPEAKER IS DESIGNED FOR USE IN SIDE- OR REAR-CHANNEL APPLICATIONS ONLY. FOR FRONT-OR CENTER-CHANNEL APPLICATIONS, WE RECOMMEND USING A NILES HDLCR OR HDLCR BX LOUDSPEAKER.

PLACEMENT FOR HOME THEATER REAR APPLICATIONS

In home theater, the goal is to reproduce the experience of a great movie theater in your home. The biggest difference between the two venues is the use of a rear- or surround-speaker array in a commercial theater. Here, it is not uncommon to see 20 or 30 speakers placed around theater walls. This huge array of speakers assures the audience will feel completely surrounded by the ambient soundtrack of the movie.

Filmmakers carefully use the “surround” soundtrack to envelope viewers in the sound environment on screen. They will place background music, rain sounds, traffic noise, etc. on the “surround”

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PLACEMENT FOR HOME THEATER REAR APPLICATIONS *(CONTINUED)*

soundtrack to create desired effects. However, in a home with a single pair of front speakers, this surround effect will be lost, and jungle sounds may actually sound like they are emanating "from the middle of your head," just like headphones!

A single pair of CM6HDfx Loudspeakers, properly placed, can create a very convincing simulation of an array of surround speakers. Here are some recommended placement tips:

- *Place the surround speakers near a hard reflecting surface, as shown in* ***Figure 2****. The reflections will help one pair of speakers to sound like several. If possible, try placing them near a corner (so that the adjoining walls will act as a powerful reflector) to create even more reflections, as shown in* ***Figures 3*** *and* ***4.***

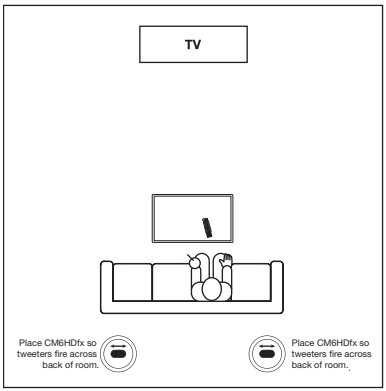

Figure 2. CM6HDfx loudspeakers placed near a back wall of a home theater room.

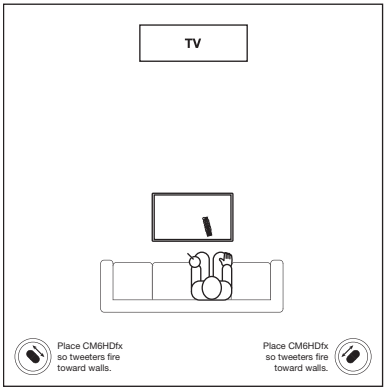

Figure 3. CM6HDfx loudspeakers placed near back corner walls of a home theater room.

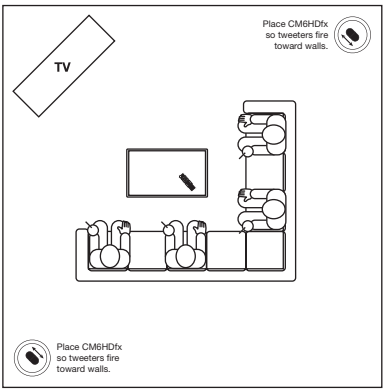

Figure 4. CM6HDfx loudspeakers placed near back corner walls of a home theater room with an L-shaped sofa.

- *If you place the surround speakers farther away from the listener, both the reflected and the direct sound will dissipate, requiring even more power from the surround-sound channels. If your sound system uses a small 5- or 10-watt surround amplifier for the rear speakers, be sure to place the speakers within 5 to 8 feet of the listening location.*

- *If you are using a larger 25- to 50-watt surround amplifier, you can mount the speakers 10 to 15 feet away from the listening location and still achieve reasonably high volume levels. In large or unusually-shaped rooms, this might be the only way to achieve a good effect.*

- *If you like listening to music in surround modes (which emulate concert hall acoustics), consider using more than two surround speakers to provide an extraordinary effect. With Niles CM6HDfx loudspeakers, it is easy to add another pair without affecting the decor of the room.*

  NOTE: FOR THIS APPLICATION, YOU WILL NEED TO USE A MORE POWERFUL AMPLIFIER THAN THE ONE BUILT INTO A TYPICAL SURROUND-SOUND RECEIVER OR AMPLIFIER. NILES MAKES A NUMBER OF SYSTEMS INTEGRATION AMPLIFIERS WITH PROPRIETARY FEATURES THAT MAKE THEM UNIQUELY SUITED TO ENHANCE YOUR EXISTING SURROUND-SOUND SYSTEM. CONSULT YOUR LOCAL NILES DEALER FOR MORE INFORMATION.

- *If your home theater system is capable of reproducing Dolby EX surround sound, consider using a second pair of CM6HDfx speakers (on the side walls) for an additional rear surround effect, as shown in* ***Figure 5****.*

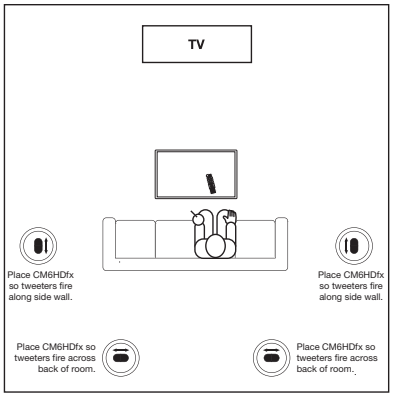

Figure 5. Two pairs of CM6HDfx loudspeakers reproduce Dolby EX surround sound in a home theater room using only DIFFUSE settings.

THE BOUNDARY EFFECT

Placing a speaker in a corner can powerfully affect the way a listener perceives bass response. Known as the boundary effect, placing speakers close to a wall/ceiling boundary or near a corner-wall boundary will emphasize certain bass frequencies while canceling others. This effect can make the speaker sound excessively boomy and inaccurate to some listeners, while to others it just seems like more bass sound.

As a good rule-of-thumb, if you like listening to your current pair of speakers with the bass turned up, you'll enjoy corner placement. However, if you listen with the tone controls at neutral, try keeping the speakers at least 2 or 3 feet from the boundaries of the room.

USING THE DIRECT RADIATING/DIFFUSE FIELD SELECTOR SWITCH

If the listener prefers a more diffuse sound field, set the DIRECT/DIFFUSE switch to the DIFFUSE position, as shown in **Figure 6**. The DIFFUSE setting provides less localization of the sound and a more spacious feel. Make sure to align the speakers so the "out-of-phase" tweeters (identified by a gray dot) are oriented in the same direction, relative to the listener. If desired, experiment with tweeter orientation to give the most pleasant sound for your particular installation.

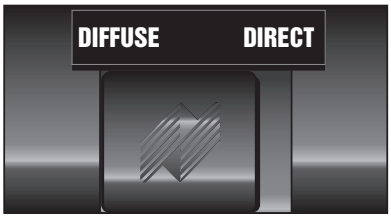

Figure 6. The CM6HDfx DIRECT/DIFFUSE switch is set to DIFFUSE for a more spacious sound field.

If the listener prefers a more direct sound field, set the DIRECT/DIFFUSE switch to the DIRECT position, as shown in **Figure 7**. The DIRECT setting provides more localization of sound and creates a more dramatic surround effect. If desired, experiment with tweeter orientation to give the most pleasant sound for your particular installation.

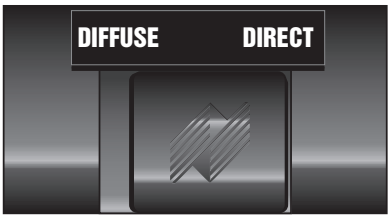

Figure 7. The CM6HDfx DIRECT/DIFFUSE switch is set to DIRECT for a more dramatic sound field.

USING THE TWEETER LEVEL CONTROL

After installation, the installer can de-emphasize the treble response by 3 dB to accommodate reflective surfaces and corner loading by setting the baffle-mounted TWEETER LEVEL control to –3 dB, as shown in **Figure 8.**

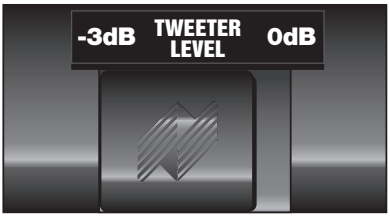

Figure 8. The CM6HDfx TWEETER LEVEL control has two response settings. Moreover, by using the TWEETER LEVEL control in conjunction with the DIRECT/DIFFUSE switch, the surround sound field can be tailored in a variety of ways.

INSTALLATION FUNDAMENTALS

RUNNING THE SPEAKER WIRE IN NEW CONSTRUCTION

IMPORTANT: IF YOU HAVE DOUBTS ABOUT WHETHER YOU ARE CAPABLE OF INSTALLING A NILES CEILING MOUNT LOUDSPEAKER, PLEASE CONSULT A NILES DEALER OR PROFESSIONAL INSTALLER. THEY HAVE SPECIAL TOOLS, TECHNIQUES, AND EXPERIENCE TO MAKE THE IMPOSSIBLE JOB POSSIBLE. THE INSTALLER CAN PROVIDE YOU WITH AN ESTIMATE BEFORE ANY WORK IS DONE.

OBSERVE SAFETY FIRST!

- *Always wear gloves, safety goggles, and head protection gear when drilling or cutting holes.*
- *Avoid drilling near nails – they ruin bits and can cause injury.*
- *Be careful using "hole-hogs" and other powerful electric drills. The torque of this drill when suddenly stopped by a nail can break the wrist of a strong man.*

SCHEDULING AND PREPARATION

Plan to schedule the speaker wiring after the electrical wiring is finished. That way you can avoid wire routes, which could potentially induce hum over the speaker wire. The basic wiring rules are:

- *Never run speaker wire through the same hole as an electrical cable.*
- *Never run speaker wire into the same J-box as electrical cable.*
- *Avoid running the speaker wire beside the electrical cable. Keep your speaker cable at a distance of at least 3 feet from any electrical power cable.*
- *If side-by-side wiring is unavoidable in particular spots in the house, move the speaker wire route away as soon as possible.*
- *If construction forces a side-by-side run for more than 10 feet, install metal conduit or shielded speaker wire. Low-voltage wires such as doorbells, intercoms, telephone, security, or television cannot cause interference or hum on your speaker wires, so you can safely run all of them at the same time, through the same holes, side-by-side.*
- *Before drilling any holes, mount the speaker brackets in the desired speaker Locations and mount p-rings or open-backed J-boxes where the in-wall volume Controls and stereo equipment will be located.*

ABOUT DRILLING

Use a bit that is large enough for the wires you plan to run. This is an important consideration, since you may be drilling a lot of holes. Here are some additional tips:

- *We recommend using an auger bit for rough-in wiring. It will actually pull itself through the wood, so that the drill motor, not you, does most of the work.*
- *Always drill the holes in the center of the stud. If you have to notch the stud or drill the hole closer than 1 inch from the edge of the stud, protect the wire with a nail plate, as shown in* ***Figure 9****.*
- *When drilling holes in ceiling joists, drill in the center of the joists and try to locate the hole near the end of the joist.*

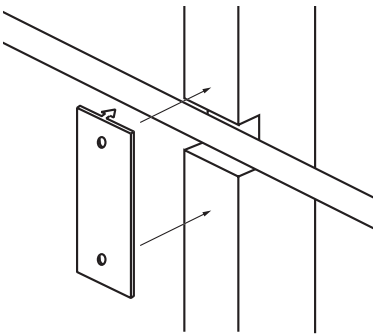

Figure 9. Installing a nail plate to protect wiring in a notched stud.

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ABOUT DRILLING *(CONTINUED)*

IMPORTANT: DO NOT DRILL THROUGH A GLU-LAM OR LOAD-BEARING BEAM WITHOUT THE DIRECTION OF YOUR CONTRACTOR.

- *Try to line the holes up perfectly, because it makes pulling the wire much easier. A good technique is to snap a chalk line across the face of the studs or against the bottom of the ceiling joists. Then work backward so that you can always see the holes you have already drilled. Paying careful attention to this will save you time later on.*

PULLING THE CABLE

Pull the cable in sections (from the stereo to the volume control, from the volume control to the speaker). Start with the longest sections and use leftover wire to complete the short sections. Also consider the following wiring tips:

- *If you plan to pull many rooms at the same time through a central route, walk off the Distance to each destination, add a generous "fudge factor" for turns and other Obstacles, and then cut off each section, so you can pull a bundle of wires at once.*
- *When running the wire further than 4-1/2 feet from a hole in a stud or joist (e.g., open attic space, going up walls, etc.), be sure to fasten the wire to the joists or studs using cable clamps or appropriately-sized wire staples. The wire should not have large sags in it, nor should it be too tight.*
- *Try to protect the wire from being stepped on in attics or other unfinished crawl spaces. Use guard strips, raceways, or conduits to protect the cable. Consult the local building code for special requirements in your area.*

CONCEALING SPEAKER WIRE

ABOUT INTERIOR WALLS

Interior walls in almost all North American residences are hollow, so they are easy installation sites for flush mounting speakers and routing new speaker cable in the house. Looking at a painted wallboard, plaster, or paneling, you only see the skin of the wall. Behind it is the home's skeleton; 2-by-4 inch wood or metal "studs" running vertically from the floor to the ceiling in walls and 2-by-6 inch or larger "joists" running horizontally in the ceilings and floors. The space between the studs and joists is used for the home's wiring and plumbing.

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CONCEALING SPEAKER WIRE *(CONTINUED)*

ABOUT EXTERIOR WALLS

Concealing wires in exterior walls is more complex, since the walls are stuffed with insulation to protect the house from the heat and cold outside. Moreover, our national building code requires that a horizontal stud placed between the vertical studs break the hollow wall space in exterior walls. This "fire blocking" makes it very difficult to retrofit long lengths of wire. In some areas of the country, the exterior walls are constructed of solid masonry and have no hollow space for speakers or wires.

PLANNING THE SPEAKER WIRE ROUTE

Start by examining all the possible routes you might take to run the speaker wire from the speaker to the home theater system. Use a stud sensor or other device to locate the internal structure of the wall. You will want to avoid all studs or joists. **Figure 10** shows a typical wire run from the speaker location in the ceiling, across the attic, then down through a top plate (i.e., the horizontal 2-by-4 or 2-by-6 inch wood laid across the vertical studs) to a wall plate or a J-Box in the wall behind the home theater system itself.

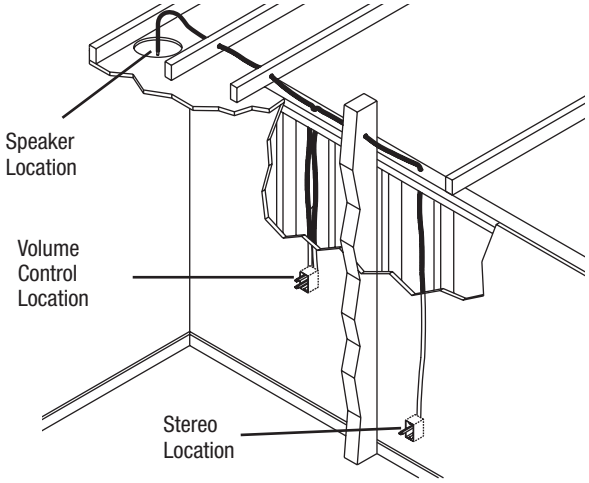

Figure 10. Running speaker wire from a ceiling speaker to a home theater system location.

Find all the locations of your existing electrical, phone, and TV wiring, and then plan the speaker wire route to avoid them. Crossing wire paths is acceptable, but 60 Hz hum may be induced in the reproduced audio, if speaker wire is run parallel to electrical wire for more than a few feet. If possible, try to keep speaker wire away from parallel power cables by at least 3 feet.

To find exactly where an electrical cable is routed, try inspecting the inside of the wall by turning off the breaker for a particular power outlet or switch, removing the cover plate and switch or receptacle, and then shining a penlight into the wall. If you have access to an attic or basement space, you can quickly see which part of the wall space is free of obstructions, as shown in **Figure 11**.

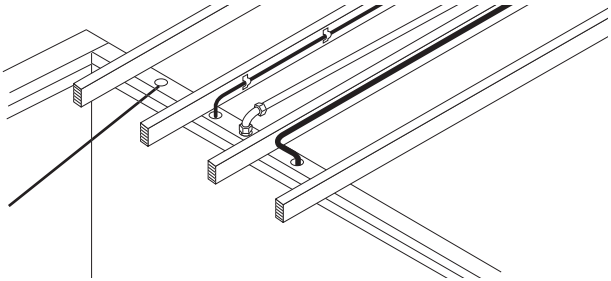

Figure 11. An example of unobstructed wall space for speaker wiring.

When you don't have access above or below the wall, try to estimate the existing wire and pipe locations from known positions of electrical outlets and plumbed fixtures on both sides of the wall. Take a look at the outside of your house too – sometimes conduit, vents, or drainpipe will provide useful visible clues. Choose the route with the fewest potential obstacles.

If the home is built on a slab, or a speaker wire route is planned between two finished floors, look for baseboards that could be removed for wire placement. Doorjambs can also be removed and often have enough space for speaker wire all the way around the door, as shown in **Figure 12**.

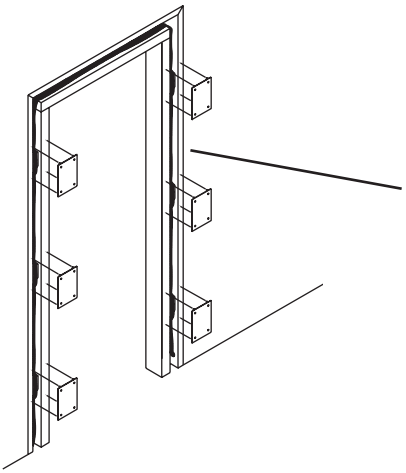

Figure 12. Running speaker wire between a wall and a removed doorjamb. Nail plates are also installed to protect the wire when the doorjamb is replaced.

OTHER POSSIBLE SPEAKER WIRE ROUTES INCLUDE:

- *Under-the-carpet runs using flat speaker wires.*
- *Heating and air conditioning vents used as wire raceways for plenum-rated wire.*

  NOTE: CHECK YOUR LOCAL BUILDING CODES, SINCE SOME MUNICIPALITIES REQUIRE CONDUIT.

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CONCEALING SPEAKER WIRE *(CONTINUED)*

CUTTING HOLES

In traditional wood stud/drywall construction, first cut the hole for the speaker. Then, in the opening, use a drill with a long bit to auger a route across the ceiling joists. Sometimes, you will need to use a "notching" technique to reach areas the drill bit won't reach or to turn corners (e.g. down a wall without an accessible attic).

Avoid making an irregular hole in the drywall. By carefully cutting a rectangular hole, you can later use the cut drywall as the patch. Notch the bottom of the joists and run the wire through the notches, protecting the wire with nail plates, as shown in **Figure 13**.

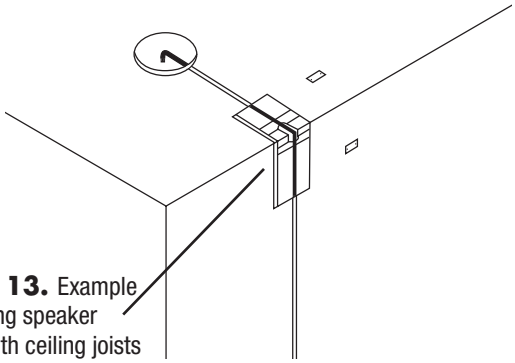

Figure 13. Example of a ceiling speaker cutout with ceiling joists notched for wire run.

After the wire has been run, patch the hole with the cut drywall using standard drywall joint tape and joint compound. Let the patch dry, sand the surface, and touch-up the wall with paint.

NEW CONSTRUCTION: INSTALLATION OF BRACKETS, FRAMES, AND GRILLES

INSULATING THE CEILING CAVITY

If feasible, fill the ceiling cavity with insulation after cutting speaker holes.

MOUNTING THE NEW CONSTRUCTION BRACKET

The hole-saving bracket enables a faster and cleaner final installation of the speaker. It forces the drywall installer to cut out the speaker hole for you and provides wire ties for the speaker wire, reducing the risks of accidental loss or movement of the wire. In addition, it enables you to align your speakers with other ceiling fixtures with greater accuracy, since you can see exactly where the speaker will be.

INSTALLING THE BRACKET

1. *Attach the QuickSnap™ new-construction wings to the bracket by snapping them into the bracket sides. If the length will interfere with corner or eaves, you can shorten the wings by breaking them along the scored lines.*

   NOTE: THE WINGS AND BRACKETS HAVE CENTERING LINES TO SIMPLIFY PLACEMENT OF THE SPEAKERS.

2. *Screw one side of the assembled bracket with wings to the joist, using one of the supplied screws. Level the bracket, and then screw the other side of the bracket/wing assembly to the joist. Two screws on each side make for a very secure installation.*

3. *Secure the wire to the bracket using bracket's wire tie. The drywall installers will cut the drywall to the exact size of the bracket, as shown in* ***Figure 14****.*

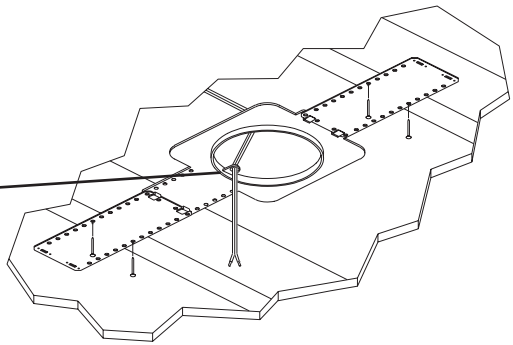

Figure 14. The optional hole-saving brackets are installed, and the speaker wire is attached to the bracket.

CONCEALING SPEAKER WIRE FOR A FUTURE INSTALLATION

1. *Attach the speaker wire in a loop between the ceiling joists and carefully mark the exact location of the wire on a set of plans.*

2. *Ask the general contractor to inform the drywall installers that the speaker wire loops are concealed for future installations, as shown in* ***Figure 15****.*

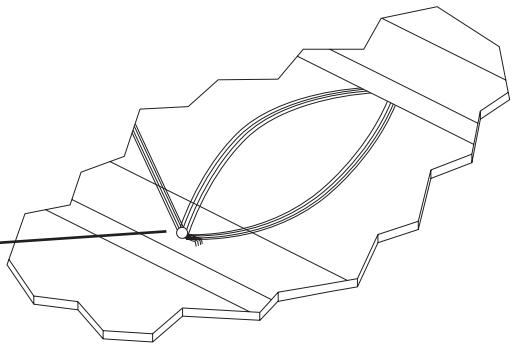

Figure 15. The speaker wire is looped and hung on two nails attached to the joists, securing it for future use. Be sure to note the location on house plans.

EXISTING CONSTRUCTION: INSTALLATION OF BRACKETS, FRAMES, AND GRILLES

PLANNING THE INSTALLATION

IMPORTANT: BEFORE YOU CUT INTO ANY WALL, REVIEW THE SECTIONS SPEAKER PLACMENT ON PAGE 6 AND RUNNING THE SPEAKER WIRE IN NEW CONSTRUCTION ON PAGE 10. BE SURE NOT TO DRILL OR CUT THROUGH EXISTING WIRES, PIPES, OR STRUCTURE. IF YOU FEEL ANY EXTRA RESISTANCE AS YOU ARE DRILLING OR SAWING, STOP!

1. *Locate joists by using a stud sensor or by hand knocking. Keep in mind that the mounting "dogs" will extend 3/4 inch beyond the cutout. Make sure you do not place the edge of the cutout directly next to a ceiling joist.*

2. *At the planned cutout site, drill a 1/8-inch pilot hole just barely through the ceiling, about an inch below the center of your proposed speaker location.*

   NOTE: IN MOST HOMES, THE CEILING THICKNESS IS 1/2 TO 5/8 INCH.

3. *Cut a foot-long piece of coat hanger and bend it to create a right angle, leaving 3/4 inch to allow for the extra width of the mounting dogs. Poke the "L-shaped" wire into the pilot hole and turn it in a complete circle, as shown in* ***Figure 16****.*

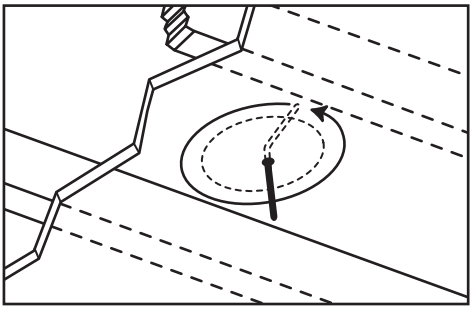

Figure 16. Using a coat hanger to check for obstructions behind the ceiling speaker site.

4. *Continue turning the coat hanger as you move it into the ceiling cavity to a depth of approximately 6 inches. If you feel an obstruction, fill the hole(s) with spackling compound and repeat steps 1 through 4 at a new location.*

5. *If the coat hanger moves freely in a complete circle, hold the supplied template up to the ceiling surface. Use a pencil to outline the circular cutout on the ceiling surface. Then drill a starting point with a 1/4-inch bit.*

6. *If you are cutting drywall, use a sheetrock or keyhole saw. Cut the hole with the saw at a 45-degree angle. That way, the drywall section can be replaced cleanly if there is an unseen obstruction behind the wall.*

7. *If you are cutting into a plaster ceiling, use masking tape to outline your penciled circle and use a razor to score the plaster down to the lath beneath. Then use a chisel to remove all of the plaster within the taped outline. To actually cut the lath, consider the following two professional methods:*

   - *Use a saber saw with a metal cutting blade for the quickest cut. However, sawing lath with a saber saw can easily vibrate plaster off the ceiling in a completely distant location, thereby creating more patchwork.*
   - *If you have the patience, use a pair of tin snips to slowly nip away at the lath instead. There is little risk with this method – it is just more time consuming.*

FINISHING THE INSTALLATION

INSTALLING THE SPEAKERS

1. *If possible, lay a batten of insulation into each ceiling cavity. Remember to use equal amounts of insulation for each speaker.*

2. *At each speaker, separate the speaker wire so that at least 2 inches of each conductor are free. Strip away 1/4 inch of insulation from each speaker wire and insert the appropriate wire into each spring-loaded speaker connector.*

   NOTE: OBSERVE CORRECT POLARITY: POSITIVE (+) GOES INTO THE RED TERMINAL AND NEGATIVE (–) GOES INTO THE BLACK TERMINAL.

3. *Locate the four clamps or mounting dogs which will hold each speaker in place, along with their front-baffle tightening screws. Rotate the dogs inward, insert each speaker into its cutout, and tighten the dogs by turning the screws clockwise, as shown in* ***Figure 17****.*

   NOTE: THE TIGHTENING SCREWS WILL BE EASIER TO TURN IF YOU "PRIME" THEM FIRST.

   IMPORTANT: DO NOT OVER TIGHTEN THESE SCREWS! OVER TIGHTENING THE CLAMPS MAY MAKE THE GRILLE DIFFICULT TO INSTALL.

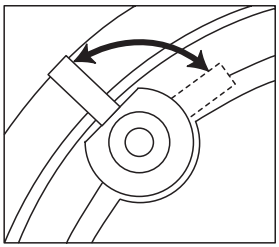

Figure 17. Tightening the clamps or mounting dogs.

4. *Perform step 2 at the amplifier end. Make sure each speaker is connected correctly according to polarity and channel use.*

5. *Turn on the surround receiver and calibrate all speakers in the surround system according to the receiver manufacturer's instructions.*

(CONTINUED ON NEXT PAGE)

INSTALLING THE SPEAKERS *(CONTINUED)*

6. *At each speaker, set the DIFFUSE/DIRECT switch according to the desired application (see page 8 for usage).*
7. *At each speaker, set the TWEETER LEVEL switch according to the desired application (see page 9 for usage).*
8. *Install grilles into each speaker – they should fit snugly. If they don't, try loosening the mounting-dog screws. They may have been tightened too much.*

PAINTING THE SPEAKERS

The CM6HDfx speakers may be painted, as the plastic frame will readily accept most paints. For best results, use a spray gun or airless sprayer, thin the paint to prevent clogging of the grille holes, and apply several light coats instead of one heavy one.

1. *Paint the grilles first and let them dry before installation.*
2. *Mask all speakers prior to painting them. You can use the inside circular portion of the hole template as a paint mask.*
3. *Remove the outside portion of the template by gently pulling along the perforation. Affix the mask to the front of the speaker using a piece of tape. Fold the tape onto itself to form a double-sided loop. Affix the tape to the tweeter and place the mask onto the speaker.*
4. *Paint the speakers. After they are dry, install the grilles.*

CHECKING SPEAKER PHASE

Speaker wire has two conductors. On both your speaker and amplifier, one conductor is attached to the negative (–) terminals, while the other is attached to the positive (+) terminals. Usually, the wire is marked for your convenience, but the marking can be done in following different ways:

- *Stripe on one wire*
- *Ribbed area you can feel on one conductor*
- *Different colors of metal wire on each conductor*
- *Fabric strand or string wound into one of the conductors*

Of course, there are some wires which appear completely identical. So be careful, or you might make a connection mistake. If you do, one speaker will be playing "out-of-phase" with the other speaker. A pair of out-of-phase speakers works against each other, and the sound of the two

playing together will be lacking in bass and sound "phasey." If you suspect the sound is not right, and you cannot see any markings on the wire, try this simple test:

1. *Stand halfway between the speakers.*
2. *Play some music with the amplifier or radio set to Mono.*
3. *Listen to the richness of the bass and the loudness of the sound.*
4. *Turn off the amplifier and reverse the connections on one amplifier channel only.*
5. *Repeat the listening test with the same volume control setting. When the sound has a richer bass and is slightly louder, the speakers are working together or "in-phase."*

OPERATION

LISTENING AT HIGHER VOLUMES

Achieving a reasonable volume of sound in a large room requires more amplifier power than it does in a small room. It is possible to turn the volume up so high that the amplifier runs out of power. This creates "clipping" distortion, which will make treble sound very harsh and unmusical.

When you hear harsh-sounding treble from any good speaker, turn the volume down immediately! Those harsh sounds are masking much more powerful ultra-high-frequency sound spikes, which will quickly damage any fine loudspeaker. You are much less likely to damage a speaker driven by a large amplifier because it will be very loud before any clipping distortion is produced.

CLEANING

Clean the Niles CM6HDfx loudspeaker with a dampened soft cloth or paper towel. If the speaker is mounted high up on a wall or ceiling, use a broom to gently brush it off.

SPECIFICATIONS

Recommended Amplifier Power
10 to 125 watts per channel

Nominal Impedance
8 ohms

Frequency Response
60 Hz to 21 kHz, +/- 3 dB (on axis)

Overall Exterior Dimensions
9-1/4" diameter

(CONTINUED ON NEXT PAGE)

SPECIFICATIONS *(CONTINUED)*

Hole Cut-Out Dimensions
8" diameter

Depth Behind Ceiling
3-3/4" (based on 1/2" drywall)

Wiring Requirements
We recommend using 16- to 18-gauge speaker wire for runs up to 80 feet and 14-gauge speaker wire for runs up to 200 feet. The connectors will accommodate 12- to 22-gauge wire.

LIMITED WARRANTY

NILES AUDIO CORPORATION ("NILES") WARRANTS ITS LOUDSPEAKER PRODUCTS TO THE ORIGINAL PURCHASER TO BE FREE OF MANUFACTURING DEFECTS IN MATERIAL AND WORKMANSHIP FOR A PERIOD OF FIVE YEARS FROM DATE OF PURCHASE.

THIS WARRANTY IS SUBJECT TO THE FOLLOWING ADDITIONAL CONDITIONS AND LIMITATIONS. THE WARRANTY IS VOID AND INAPPLICABLE IF NILES DEEMS THAT THE PRODUCT HAS BEEN USED OR HANDLED OTHER THAN IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED BY THE MANUFACTURER, INCLUDING BUT NOT LIMITED TO DAMAGE CAUSED BY ACCIDENT, MISHANDLING, IMPROPER INSTALLATION, ABUSE, NEGLIGENCE, OR NORMAL WEAR AND TEAR, OR ANY DEFECT CAUSED BY REPAIR TO THE PRODUCT BY ANYONE OTHER THAN NILES OR AN AUTHORIZED NILES DEALER.

TO OBTAIN WARRANTY SERVICE, TAKE THE UNIT TO THE NEAREST AUTHORIZED NILES DEALER, WHO WILL TEST THE PRODUCT AND IF NECESSARY, FORWARD IT TO NILES FOR SERVICE. IF THERE ARE NO AUTHORIZED NILES DEALERS IN YOUR AREA, YOU MUST WRITE TO NILES AND INCLUDE YOUR NAME, ADDRESS, MODEL AND SERIAL NUMBER OF YOUR UNIT, ALONG WITH A BRIEF DESCRIPTION OF THE PROBLEM. A FACTORY RETURN AUTHORIZATION NUMBER WILL BE SENT TO YOU. DO NOT RETURN ANY UNIT WITHOUT FIRST RECEIVING WRITTEN AUTHORIZATION AND SHIPPING INSTRUCTIONS FROM NILES.

IF THE ABOVE CONDITIONS ARE MET, THE PURCHASER'S SOLE REMEDY SHALL BE TO RETURN THE PRODUCT TO NILES, IN WHICH CASE NILES WILL REPAIR OR REPLACE, AT ITS SOLE OPTION, THE DEFECTIVE PRODUCT WITHOUT CHARGE FOR PARTS OR LABOR. NILES WILL RETURN A UNIT REPAIRED OR REPLACED UNDER WARRANTY BY SHIPPING SAME BY ITS USUAL SHIPPING METHOD FROM THE FACTORY (ONLY) AT ITS EXPENSE WITHIN THE UNITED STATES OF AMERICA. THERE ARE NO OTHER WARRANTIES, INCLUDING WITHOUT LIMITATION, EITHER EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT.

REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER/ PURCHASER. NILES SHALL NOT BE RESPONSIBLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES EXCEPT TO THE EXTENT PROVIDED (OR PROHIBITED) BY APPLICABLE LAW.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

FOR THE NAME OF YOUR NEAREST AUTHORIZED NILES DEALER CONTACT:
NILES AUDIO CORPORATION, P.O. BOX 160818, MIAMI, FLORIDA 33116-0818.

Please fill in your product information and retain for your records.

*Model*_____ *Serial No.*_____ *Purchase Date*_____

DETACH HERE AND RETURN TO: NILES AUDIO CORPORATION WARRANTY REGISTRATION DEPT. P.O. BOX 160818 MIAMI, FLORIDA 33116-0818

WARRANTY REGISTRATION CARD

Model Purchased_____

Serial Number_____

Date Purchased (month/day/year)_____

Dealer Name and Location_____

_____

❍ Dr. ❍ Miss ❍ Mr. ❍ Mrs. ❍ Ms.

Name_____

Address_____

_____

City_____State_____Zip_____

Telephone ( )_____

Please take a moment to fill out our warranty registration card. The information helps us to get to know you better and develop the products you want

Age:
❍ *Under 25*
❍ *25-34*
❍ *35-44*
❍ *45-54*
❍ *55 & over*

Income:
❍ *Under $24,999*
❍ *$25,000-$34,999*
❍ *$35,000-$44,999*
❍ *$45,000-$59,999*
❍ *$60,000-$74,999*
❍ *$75,000-$99,999*
❍ *Over $99,999*

Occupation:
❍ *Arts/Entertainment*
❍ *Business Owner*
❍ *Engineer*
❍ *Finance/Accounting*
❍ *General Office*
❍ *Management*
❍ *Professional*
❍ *Sales/Marketing*
❍ *Student*
❍ *Tradesperson*

Musical tastes: (Please check all that apply)
❍ *Alternative*
❍ *Classical*
❍ *Country*
❍ *Jazz*
❍ *New Age*
❍ *Popular*
❍ *R&B*
❍ *Rock*
❍ *Other* _____

How did you hear about Niles?
❍ *Architect/Developer*
❍ *Custom Installer*
❍ *Direct Mail*
❍ *Friend/Family*
❍ *In-Store Display*
❍ *Interior Designer*
❍ *Magazine Ad*
❍ *Mail-Order Catalog*
❍ *Newspaper Ad*
❍ *Product Brochure*
❍ *Product Review*
❍ *Retail Salesperson*

What magazines do you read?
1. _____

2. _____

3. _____

Who will install the product?
❍ *Custom Installer*
❍ *Electrician*
❍ *Friend*
❍ *Myself*

Which factor(s) influenced the purchase of your Niles product? (Please check all that apply)
❍ *Ease of Use*
❍ *Price/Value*
❍ *Product Features*
❍ *Quality/Durability*
❍ *Reputation*
❍ *Style/Appearance*
❍ *Warranty*

Do you . . . ?
❍ *Own a House. If yes, how many square feet?*

_____

❍ *Own a Town House/ Condominium/Co-op*
❍ *Rent an Apartment*
❍ *Rent a House*

Are you interested in receiving literature on other Niles products?
❍ *Yes* ❍ *No*

Are there products/ capabilities that you would like to see introduced?

_____

_____

_____

_____

BLENDING HIGH FIDELITY AND ARCHITECTURE®

Niles Audio Corporation
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Designed and Engineered in USA
Made in China